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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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10/672,091

09/26/2003

Phillip E. Russell

5051-538DV2

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20792

7590

03/10/2005

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EXAMINER

SMITH, JOHNNIE L

ART UNIT

PAPER NUMBER

2881

DATE MAILED: 03/10/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No. 10/672,091	Applicant(s) RUSSELL ET AL.	
	Examiner Johnnie L. Smith II	Art Unit 2881	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 10 December 2004.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-13 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-13 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Response to Arguments

1. Applicant's arguments with respect to claims 1-12 have been considered but are moot in view of the new ground(s) of rejection.

Claim Rejections - 35 USC § 103

2. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

3. The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

4. Claims 1-4, 6, 7 and 13 are rejected under 35 U.S.C. 103(a) as being unpatentable over US patent 5,798,529 (Wagner et al) in view of US patent 5,683,547 (Azuma et al). In reference to claim 1, Wagner's claim 1 is identical to applicant claim 1, and only differs in that Wagner fails to specifically disclose the said etch enhancing material as being an organic chloride. Such disclosure is taught in Azuma (column 23 lines 15-23). It would have been obvious to one of ordinary skill in the art to substitute the well known material of Azuma into the teaching of Wagner since it is taught in Azuma that etching can be stopped at a desired layer of material by selecting the most suitable reactive gas for the material of the sample, and one would be compelled to do so because of the claimed gas high reactivity to the said material herein.

5. In reference to claims 2-4, 6 and 7, Wagner's claims 2, 3, 5, 10 and 11 are identical.

6. In reference to claim 13, Azuma teaches the said apparatus wherein the discharge device comprises a reservoir (20) that contains the desire reactive gas (figure 1)

7. Claim 5 is rejected under 35 U.S.C. 103(a) as being unpatentable over US patent 5,798,529 (Wagner et al) in view of US patent 5,683,547 (Azuma et al) in further view of US patent 5,766,379 (Lanford et al). Wagner in view of Azuma,

discussed above, teaches all elements upon which the claim depends but fails to clearly show a metrology device wherein the semiconductor device includes a copper layer. Such a layer is taught and disclosed in the reference of Lanford (column 4 lines 26-61). It would have been obvious to one of ordinary skill in the art at the time of the invention since it is taught in Lanford that copper is a preferred material (column 1 line 11-20) and one would be compelled to use such a material because of its lower electrical resistivity and superior electro migration lifetime in comparison to widely used aluminum based metals.

8. Claims 8-12 are rejected under 35 U.S.C. 103(a) as being unpatentable over US patent 5,482,802 (Cellar et al). In reference to claims 8 and 9, Cellar teaches a method by which the claimed limitations can be met (figures 2 and 3 column 5 lines 1-67) and wherein the surface portion has a surface topography of less than 30 or 20% (column 5 lines 40-45). Cellar lacks the copper layer being claimed by applicant, but one of ordinary skill in the art would be able to substitute such a layer since Cellar teaches such a broad range of layers capable of being removed via well-known processes being taught by Cellar for the purpose of exposing the said substrate.

9. In reference to claim 10. Cellar shows a well formed from the above-discussed process (figure 2).

10. In reference to claims 11 and 12, Cellar teaches the substrate comprising a dielectric or semiconductor (column 1 lines 20-39).

Conclusion

11. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. US patents 5,756,236 (Cordes et al), 6,730,237 (Sievers et al), and 6,414,307 (Gerlach et al), teach art similar to that being claimed by applicant, more specifically, focused ion beam methods and apparatuses.

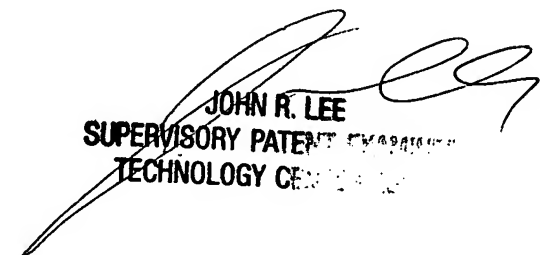
Any inquiry concerning this communication or earlier communications from the examiner should be directed to Johnnie L. Smith II whose telephone number is 571-272-2481. The examiner can normally be reached on Monday-Thursday 7-4 P.M. and Alternate Fridays.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, John R. Lee can be reached on 571-272-2477. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).


JLSII

Johnnie L Smith II
Examiner
Art Unit 2881


JOHN R. LEE
SUPERVISORY PATENT EXAMINER
TECHNOLOGY CENTER